

CLEANUP AND ABATEMENT ORDER NO. R5-2008-____
FOR
HJ BAKER & BRO. INC AND THE PORT OF STOCKTON
MOLTEN SULFUR PROCESSING PLANT
SAN JOAQUIN COUNTY

ATTACHMENT B
REQUIREMENTS FOR SAMPLE COLLECTION AND ANALYSIS PLANS,
MONITORING WELL INSTALLATION WORKPLANS, AND
MONITORING WELL INSTALLATION REPORTS

Any Sample Collection and Analysis Plan (SAP) prepared for the Discharger's facility will contain, at a minimum, the information in Section 1.

In addition, prior to any installation of any monitoring wells, the Discharger must submit a monitoring well installation workplan (MWP) that will contain, at a minimum, the information listed in Section 2, below. Any proposed wells may be installed after Regional Water Board staff concurs with the MWP and SAP.

Upon installation of any monitoring wells and receipt of analysis, the Discharger must submit a well installation and analytical report (Report). The Report must include the information contained in Section 3, below. The SAP, MWP, and Report must be prepared under the direction of, and signed and stamped by, a registered geologist or civil engineer licensed by the State of California.

SECTION 1 – Sample Collection and Analysis Plan (SAP)

All Sampling Collection and Analysis Plans must contain, at a minimum, the following information:

- A. Table of Contents
- B. General Information, Purpose, and Scope of the Plan
- C. Include the requirements of when and how to notify the Regional Water Quality Control Board staff regarding results of analysis. Include phone, certified mail, and resample results notification time lines, procedures, and requirements.
- D. Technical Information for sampling collection and analysis
 - 1. Proposed locations for leachate, tunnel, and surface water sampling.
 - 2. Tables with a list of all individual analytes by EPA Test Method, the practical quantitation limit, and the method detection limit for each individual analyte.
 - 3. Table with sample identification numbers (including groundwater monitoring wells, leachate, tunnel water, surface water, field duplicates, and MS/MSDS) and the list of test methods to be performed for each sample identification number.
 - 4. Map that shows sample locations by their respective sample identification numbers.
 - 5. Table with analytical methods, volumes, containers, preservatives, special field methods (such as field-filtering), preservation methods, practical quantitation limits, method detection limits, and hold times.

6. Identification of analytical laboratory and California DHS certification number
 7. Chain of custody (COC) procedures and a copy of a sample COC.
 8. Field procedures in sequential numbered order.
- E. Field instrument calibration procedures and QA/QC procedures for field and laboratory analysis.
- F. List of the Analytical Laboratory Reporting Requirements, as defined below:
1. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. The analytical method having the lowest method detection limit (MDL) must be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
 2. **“Trace” results**, results falling between the MDL and the practical quantitation limit (PQL), must be reported as such, and must be accompanied by both the estimated MDL value and PQL value for that analytical run.
 3. **MDLs and PQLs** must be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs must reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.
 4. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results must be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The **MDL must always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result.** The PQL must always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent’s actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
 5. All **QA/QC data** must be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results must be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results must be appropriately flagged.
 6. Unknown chromatographic peaks must be reported, flagged, and tracked for potential comparison to subsequent unknown peaks that may be observed in

future sampling events. Identification of unknown chromatographic peaks that recur in subsequent sampling events may be required.

7. The statistical method must account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Title 27 CCR §20415(e)(7) that is used in the statistical method must be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the waste discharge requirements (WDRs) for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to Title 27 CCR §20415(e)(7), must consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22 CCR, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) must be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties".
8. Case narratives signed by the laboratory director.
9. All chains-of-custody must be signed as received by the laboratory.
10. All laboratory reports must be signed by an authorized representative of the laboratory.

G. Constituents of Concern

1. Provide a table with the Constituents of Concern and their corresponding water quality objectives

H. Groundwater Well Sampling

9. Minimum time after development before sampling (48 hours)
10. Well purging method and purge water volume, storage, and disposal
11. Equipment decontamination procedures
12. Field equipment decontamination procedures
13. Copy of the field data sheet for recording and documenting data.

E. Proposed analytical laboratory.

F. Proposed Schedule for Sampling and Analytical Reports

1. Provide a time-schedule that at a minimum shows fieldwork, laboratory analysis, and report preparation.

G. Required Analytical Parameters and Test Methods

1. The analytical parameters listed in the Monitoring and Reporting Program No. R5-2008-____ must be used unless otherwise directed and/or approved by the Regional Water Board staff.

2. SAP signed and stamped by California Licensed engineer or geologist
-

SECTION 2 - Monitoring Well Installation Workplan

A. General Information:

1. Purpose of well installation and sampling/analysis project
2. Site location map
3. Copies of County Well Construction Permits (to be submitted after workplan review)
4. New monitoring well locations and rationale
5. Equipment decontamination procedures
6. Health and safety plan
7. Topographic map showing any existing wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details:

1. Drill rig and contractor
2. Sampling intervals and logging methods.

C. Monitoring Well Design—Graphic and Descriptive:

1. Casing diameter and centralizer spacing (if needed)
2. Borehole diameter
3. Depth of surface seal
4. Well construction materials
5. Diagram of proposed well construction details
6. Type of well cap, bottom cap either screw on or secured with stainless steel screws
7. Size of perforations and rationale
8. Grain size of sand pack and rationale
9. Thickness and position of bentonite seal and sand pack
10. Depth of well, length and position of perforated interval.

D. Well Development:

1. Method development
2. Method of determining when development is complete
3. Parameters to be monitored during development
4. Development water storage and disposal.

E. Well Survey Coordinates, horizontal and vertical:

1. Name of the Licensed Land Surveyor or Registered Civil Engineer
2. Well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates)
3. Horizontal and vertical accuracy (vertical must be at least 0.01-foot).

F. Water Level Measurement:

2. The elevation reference point at each monitoring well must be within 0.01-foot
3. Ground surface elevation at each monitoring well must be within 0.01-foot

4. Method and time of water level measurement must be specified.
- G. Proposed time-schedule with dates for proposed work.
- H. Plan signed and stamped by California Licensed engineer or geologist.

SECTION 3 - Monitoring Well Installation and Groundwater Analytical Report

A. Well Construction Details—Graphical, Tabular, and Descriptive:

1. Quantity and depth of wells drilled
2. Date(s) wells drilled and completed
3. Description of drilling and construction
4. Updated comprehensive site map with facility site features including monitoring wells, sample locations and identification numbers, storage ponds, landfills, investigation areas, groundwater gradient and iso-contour lines, buildings, tanks, and etc.
5. A well construction diagram for each well with the following details:
 - a. Well number, date started, date completed, geologist's name
 - b. Total depth drilled
 - c. Drilling Contractor and driller name and address
 - d. Depth of open hole (same as total depth drilled if no caving occurs)
 - e. Method and materials of grouting excess borehole
 - f. Footage of hole collapsed
 - g. Length of slotted casing installed
 - h. Depth of bottom of casing
 - i. Depth to top of sand pack
 - j. Thickness of sand pack
 - k. Depth to top of bentonite seal
 - l. Thickness of bentonite seal
 - m. Thickness of concrete grout
 - n. Boring diameter
 - o. Casing diameter
 - p. Casing material
 - q. Size of perforations
 - r. Well elevation at top of casing
 - s. Stabilized depth to groundwater
 - t. Date of water level measurement
 - u. Monitoring well number
 - v. Date drilled
 - w. Location

B. Well Development:

1. Date(s) of development of each well
2. Method of development
3. Volume of water purged from well

4. How well development completion was determined
5. Method of effluent disposal
6. Field notes from well development should be included in report.

C. Well Survey:

1. Coordinate system, epochs, bench marks, horizontal controls, accuracy, and precision
2. Survey results of casing elevation with the cap removed (vertical to 1/100th foot)
3. California Registered Civil Engineer or Licensed Surveyor's report, field notes, and stamp/signature in an appendix
4. Description of the measuring points (i.e. ground surface, top of casing, etc.)
5. Tabulated survey data with well numbers and horizontal and vertical coordinates.

D. Groundwater Field Sampling

1. Tabulated groundwater elevations and wells
2. Graphical presentation of groundwater gradient and iso-contour lines.
3. Tabulated field and analytical data with sample location identification numbers, water quality goals, field/analytical results, and highlighted data that is outside water quality goals

E. Laboratory Analytical Results

All analytical reports prepared for the Discharger's facility must contain, at a minimum, the information within this section.

1. Tabulated field and analytical data with sample location identification numbers, water quality goals, field/analytical results, and highlighted data that is outside water quality goals
2. Appendix with laboratory reports, COCs, and laboratory signatures on reports.
3. Laboratory reports showing results, reporting units, MDLs, PQLs, "trace" results, flagged results, matrix effects, and QA/QC results.
4. Site map(s) showing iso-concentration lines for Constituents of Concern
5. Piper Diagrams and Stiff Plots comparing upgradient and downgradient water quality parameters.
6. Discussion of results including, but not limited to, discussion of violations, exceedances, if all field and monitoring parameters were sampled and analyzed, description of groundwater flow direction, comparison of analysis and field sampling results to background and water quality goals, list of potential constituents of concern at each sampling location, and other relevant discussions.
7. Certification statement signed by an authorized representative.
8. Report signed and stamped by California Licensed engineer or geologist.